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1: Wei Sheng Wu Xue Bao. 1997 Oct;37(5):368-73. Related Articles, L

[Purification and some properties of extracellular beta-glucosid from Rhizopus japonicus IFO5318]

[Article in Chinese]

Chen X, Fujio Y.

College of Life Sciences, Wuhan University, Wuhan 430072.

The beta-glucosidase from Rhizopus japonicus IFO5318 was purified by Ammonium sulfate salting out and column chromatographies with the recove of 22%. The molecular weight of the enzyme was about 4.0 x 10(5), consisti of four identical subunits; The optimum reaction temperature and pH for the beta-glucosidase were 55 degrees C and pH 5.5, respectively; While the enzy was sensitive to heat, it could be stable at a wide range of pH. The Km and Vmax values of the enzyme were 0.825 mg.ml-1 and 135.4 mumol.min-1.mg respectively, using p-Nitrophenyl-beta-D-glucopyranoside as a substrate. The beta-glucosidase exhibited strongest hydrolysis effect on cellobiose and some its activity could be inhibited by SDS, Fe3+ and Hg2+.

PMID: 11189362 [PubMed]

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1: Bioseparation. 1999;7(6):287-95.

Fractionation of cellulase and beta-glucosidase in a Trichoderm reesei culture liquid by use of two-phase partitioning.

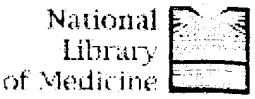
Brumbauer A, Johansson G, Reczey K.

Department of Agricultural Chemical Technology, Budapest Technical University, Hungary.

An aqueous two-phase system based on the two polymers poly(ethylene glyc and dextran has been used for the fractionation of cellulase enzymes present culture liquid obtained by fermentation with Trichoderma reesei. The activiti of beta-glucosidase and glucanases were separated to high degree by using th two-phase systems for a counter-current distribution process in nine transfer steps. While the glucanases had high affinity to the poly(ethylene glycol) ricl top phase the beta-glucosidase was enriched in the dextran-containing botton phase. Multiple counter-current distribution performed indicates the heterogeneity of beta-glucosidase activities assuming at least four isoenzyme forms. One step concentration of beta-glucosidase by using system with 46:1 phase volume ratio resulted in 16 times higher enzyme activity.

PMID: 10643639 [PubMed]





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Purification, characterization, and substrate specificity of a nov highly glucose-tolerant beta-glucosidase from Aspergillus oryza

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Aspergillus oryzae was found to secrete two distinct beta-glucosidases when was grown in liquid culture on various substrates. The major form had a molecular mass of 130 kDa and was highly inhibited by glucose. The minor form, which was induced most effectively on quercetin (3,3',4',5,7-pentahydroxyflavone)-rich medium, represented no more than 18% of total beta-glucosidase activity but exhibited a high tolerance to glucose inhibition. This highly glucose-tolerant beta-glucosidase (designated HGT-BG) was purified to homogeneity by ammonium sulfate precipitation, gel filtration, an anion-exchange chromatography. HGT-BG is a monomeric protein with an apparent molecular mass of 43 kDa and a pI of 4.2 as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and isoelectric focusing polyacrylamide gel electrophoresis, respectively. Using p-nitrophenyl-beta-D glucoside as the substrate, we found that the enzyme was optimally active at degreesC and pH 5.0 and had a specific activity of 1,066 micromol min-1 mg protein-1 and a Km of 0.55 mM under these conditions. The enzyme is particularly resistant to inhibition by glucose (Ki, 1. 36 M) or glucono-delta-lactone (Ki, 12.5 mM), another powerful beta-glucosidase inhibitor present in wine. A comparison of the enzyme activities on various glycosidic substrates indicated that HGT-BG is a broad-specificity type of fungal beta-glucosidase exhibits exoglucanase activity and hydrolyzes (1-->3)- and (1-->6)-beta-glucosidic linkages most effectively. This enzyme was able to release flavor compounds, such as geraniol, nerol, and linalol, from the corresponding monoterpenyl-beta-D-glucosides in a grape must (pH 2.9, 90 g of glucose lit 1). Other flavor precursors (benzyl- and 2-phenylethyl-beta-D-glucosides) an prunin (4',5,7-trihydroxyflavanone-7-glucoside), which contribute to the bitterness of citrus juices, are also substrates of the enzyme. Thus, this novel beta-glucosidase is of great potential interest in wine and fruit juice processi